

4 CF₃I Handling Procedure*Written Procedure*4. CF₃I Handling Procedure

- 4.1. [Bubble Chamber Glycol Fill Procedure](#)
- 4.2. [Bubble Chamber Glycol Drain Procedure](#)

This procedure covers filling or removing CF₃I from the COUPP 4-kg inner vessel at SNOlab. Risks associated with CF₃I gas overexposure include skin rashes, eye irritation, irregular cardiac rhythm if inhaled, and possibly depression of the nervous system. Vapour concentrations over 0.4% in air may cause acute effects. While CF₃I handling is intended to be a closed system operation, the risk of spillage is increased during handling operations.

The operational goal of CF₃I handling is to fill the inner vessel with a radioclean active medium, or to remove CF₃I during system decommissioning.

For all CF₃I handling, prior to handling,

- 1) Consult the appropriate CF₃I handling procedure.
- 2) Inform the Lab Coordinator that CF₃I handling is taking place, and the estimated times over which CF₃I handling will be performed. Inform nearby workers of the potential hazard of a CF₃I spill and prepare them for a possible evacuation.
- 3) Erect a permissive barrier at least 4 meters from any CF₃I line. Attach caution tags indicating that CF₃I handling is being performed and that respirators are required.
- 4) Don full face respirators with organic vapour (OV) filters.
- 5) Ensure that any non-isolatable plumbing has a volume less than 380mL.
- 6) Ensure that any external ports to the CF₃I system are closed. Check for leaks in the plumbing by pumping it down then charging it with 80 psi of compressed high purity nitrogen. Use snoop to check for gas leaks at all joints.

During CF₃I handling,

- 7) If CF₃I is spilled, do not touch it. Stop any leaks and allow the CF₃I to evaporate. If more than 1.5 mL of liquid or 380mL of gaseous CF₃I are leaked, the CF₃I may exceed occupational limits outside of the work area. Inform nearby unprotected personnel to stop work, move to a safe location and guard the area. Inform the Lab Coordinator of the spill. A UOR will have to be filed.
- 8) If more than 20mL of liquid or 5L of gaseous CF₃I are leaked, the concentration of CF₃I vapours outside the work area may exceed 0.2% and unprotected

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personnel may experience acute cardiac effects. Direct personnel away from the area immediately and guard the area. Inform the Lab Coordinator. An IIR will have to be filed.

After handling CF₃I and before removing PPE,

- 9) Isolate the warm containers of CF₃I first. Ensure that the coldest point for CF₃I is at a temperature of 5 degrees Celsius or less. Wait 5 minutes, then isolate the cold container.
- 10) Ensure that the pressure in the plumbing is less than 20psia, and vent the plumbing to air.
- 11) Wait 5 minutes for the CF₃I to dissipate, then remove PPE and barriers.
- 12) Continue cleaning up the work area.